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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,284	01/20/2006	Masaru Nakakita	28951.5462	7118

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EXAMINER	
GARCIA, CARLOS E	

ART UNIT	PAPER NUMBER
2627	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,284	NAKAKITA ET AL.	
	Examiner	Art Unit	
	CARLOS E. GARCIA	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

NON-FINAL REJECTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/13/2009 has been entered.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. JP 2003-278063, filed on 7/23/2003.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The Examiner suggests "Negative Pressure Slider with Groove".

Claim Objections

4. Applicant is advised that should claims 1, 14 and 27 be found allowable, claims 1, 14 and 27 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless – (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 4, 7, 11, 14, 17, 20, 24, 27, 30, 33 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Rajakumar (US 2003/0165031).

Re claims 1, 14 and 27: Rajakumar discloses a negative pressure utilization type of slider (as shown in Fig.5-7) comprising:

a head 332 for recording onto a disk or reproducing from a disk; and

an air bearing surface (the air bearing surface is composed of all surfaces facing the disk medium seen in Fig.5) for facing a disk, the air bearing surface comprising a plurality of flat surfaces (shown in Fig.6), the substantially flat surfaces differing in height from each other (such as in Fig.6), for generating an air flow when such disk rotates, thereby causing the slider to float over such disk,

the air bearing surface having an air inflow surface 472 (surface in Fig.7 which is located on the leftmost (air inflow) position of the slider), a positive pressure generating surface 324 and a negative pressure generating surface 334/336, respectively, in order from an air flow incoming end 314 to an air flow outgoing end 316 of the slider,

wherein the air inflow surface has a groove 470 extending between, and including, a disk inner peripheral end 322 and a disk outer peripheral end 320 of the air inflow surface (as shown in Fig.7), a bottom surface of the groove being lower in height than the air inflow surface relative to a surface opposite the disk-facing surface (see

Fig.6), the groove being parallel to and set back from the air flow incoming end, such that it does not contact an edge (edge 314) of the air flow incoming end (see para.0035-0037).

Re claims 4, 17 and 30: Rajakumar further discloses wherein the air inflow surface extends to the air flow incoming end (Fig.7).

Re claims 7, 20 and 33: Rajakumar further discloses wherein the head is a magnetic head (para.0029).

Re claims 11, 24 and 37: Rajakumar further discloses a disk device including the slider according as discussed above (Fig.1).

7. Claims 1, 4, 7, 11, 14, 17, 20, 24, 27, 30, 33 and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Chapin et al. (US 5128822; hereinafter Chapin).

Re claims 1, 14 and 27: Chapin discloses a negative pressure utilization type of slider (as shown in Fig.5d and 5f for example) comprising:

a head (see col.1 lines 6-22) for recording onto a disk or reproducing from a disk; and

an air bearing surface (the air bearing surface is composed of all surfaces facing the disk medium seen in Fig.5d and 5f) for facing a disk, the air bearing surface comprising a plurality of flat surfaces (shown in Fig.5d), the substantially flat surfaces

differing in height from each other (Fig.1 for example), for generating an air flow when such disk rotates, thereby causing the slider to float over such disk,

the air bearing surface having an air inflow surface 25 (surface in Fig.5f which is located on the topmost (air inflow) position of the slider), a positive pressure generating surface 24 and a negative pressure generating surface 28, respectively, in order from an air flow incoming end (top end) to an air flow outgoing end (bottom end) of the slider,

wherein the air inflow surface has a groove 41 (pressure relief channel) extending between, and including, a disk inner peripheral end 20 and a disk outer peripheral end 22 of the air inflow surface (as shown in Fig.5f), a bottom surface of the groove being lower in height than the air inflow surface relative to a surface opposite the disk-facing surface (see col.9 lines 12-16, 25-29), the groove being parallel to and set back from the air flow incoming end, such that it does not contact an edge (front edge of 25) of the air flow incoming end (see col.9 line 53 to col.10 line 18).

Re claims 4, 17 and 30: Chapin further discloses wherein the air inflow surface extends to the air flow incoming end (Fig.5f).

Re claims 7, 20 and 33: Chapin further discloses wherein the head is a magnetic head (col.1 lines 11-14).

Re claims 11, 24 and 37: Chapin further discloses a disk device including the slider according as discussed above (col.1 lines 11-14).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 2-3, 15-16 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chapin. The teachings of Chapin have been discussed previously.

Chapin specifically discloses the ability to modify the size, shape and depth of the cavity and/or any of the channels, rails, tapers, etc of the slider as described above, for the purpose of modifying the negative pressure characteristics for optimum performance of such slider as desired by the user (see col.5 lines 36-42; col.10 lines 39-45).

Chapin discloses the claimed invention except for wherein the air bearing surface has surfaces of three stages differing in height, the surfaces of the three stages comprising an upper stage surface highest in height, a lower stage surface lowest in height and a middle surface lower than the upper stage surface and higher than the lower stage surface, the positive pressure generating surface, the air inflow surface and the negative pressure generating surface being formed on the upper stage surface , the middle surface and the lower stage surface, respectively, as recited in claims 2, 15 and 28 or that wherein the bottom surface of the groove is flush with, and the same height as, the negative pressure generating surface, as recited in claims 3, 16 and 29.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the size, shape, depth/height of the cavity and/or channel as clearly stated by Chapin for the purpose optimizing the negative pressure performance characteristics of the slider, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955).

10. Claims 5, 9-10, 18, 22-23, 31 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajakumar or Chapin. The teachings of Rajakumar and Chapin have been discussed previously.

Re claims 5, 18 and 31: Rajakumar and Chapin disclose the claimed invention except for the groove is located at least 20 μm from the air flow incoming end.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the distance between the groove and the air flow incoming edge of Rajakumar or Chapin, to a small value for the purpose of minimizing the overall size of the slider, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Re claims 9-10, 22-23 and 35-36: Rajakumar and Chapin disclose the claimed invention except for the air bearing surface having an area of not more than 1 mm^2 or 0.5 mm^2.

It would have been an obvious matter of design choice to use a standard femto-slider with dimensions of 0.7 x 0.87 mm which would have an air bearing surface area of around 0.609 mm^2, since such a modification would have involved a mere change in the size of a component for the purpose of evaluating the relationship between the air bearing surface and the atmospheric pressure variation using the next generation slider, such as the femto-slider. Furthermore, absent a statement of criticality, a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

11. Claims 6, 12-13, 19, 25-26, 32 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajakumar or Chapin in view of Applicants Admitted Prior Art (AAPA). The teachings of Rajakumar and Chapin have been discussed previously.

Re claims 6, 19 and 32: Rajakumar or Chapin disclose the claimed invention except for wherein the groove has a width of at least 30 μm.

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the groove as shown by Rajakumar or Chapin to be at least 30 μm in width since in the AAPA (see Spec. page 21, lines 1-3) the standard femto-slider dimensions are 0.7 x 0.87 mm, the groove which extends from one inner peripheral end to an outer peripheral end of the slider must be at least 30 μm in order to obtain a slider with a groove which extends from one end for a standard femto-slider.

Re claims 12-13, 25-26 and 38-39: Rajakumar or Chapin further disclose means for recording or reproducing or both recording and reproducing in a disk region (as discussed above, the means for recording/reproducing is performed by a tranducer).

Rajakumar or Chapin discloses the claimed invention except for a relative speed between the slider and the disk is not higher than 10 m/s or 7 m/s.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the maximum relative speed between the slider and the disk for the purpose of achieving a desired recording/reproducing density in the disk apparatus as disclosed by either Rajakumar or Chapin, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

12. Claims 8, 21 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajakumar in view of Mundt et al. (US 2002/0145828; hereinafter Mundt). The teachings of Rajakumar have been discussed previously.

However, Rajakumar fails to disclose or fairly suggest the head comprises a magnetoresistive element.

Mundt teaches the use of magnetoresistive heads used in sliders for the purpose of reading magnetic media (see para.0018).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a magnetoresistive head as taught by Mundt in the

slider disclosed by Rajakumar in order to reproduce magnetic data recorded on magnetic disks.

Response to Arguments

13. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. The prior art made of record in PTO-892 Form and not relied upon is considered pertinent to applicant's disclosure.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos E. Garcia whose telephone number is 571-270-1354. The examiner can normally be reached on 8:30 am to 5:00 pm, Monday thru Thursday and 8:30 to 4:00 pm, Fridays. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea Wellington can be reached on 571-272-4483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. E. G./
Examiner, Art Unit 2627
6/1/2009

/Andrea L Wellington/
Supervisory Patent Examiner, Art Unit 2627